

INVENTOR PCT/PTO 28 FEB 2005

**PATENT**

Atty Docket No. 102364

Express Mail Label No. EV 535075158 US

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant(s):	Tomasz Heyduk et al.	Art Unit	1645
Serial No.:	10/539,107	Examiner:	To be assigned
Filing Date:	June 15, 2005	Conf. No.	2295
For:	BIOSENSORS FOR DETECTING MACROMOLLECULES AND OTHER ANALYTES		

Mail Stop PCT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT**

In accordance with 37 C.F.R. 1.97 and 1.98 and MPEP 609, and in compliance with the duty of disclosure set forth in 37 C.F.R. 1.56, Applicants submit the attached PTO/SB/08A and B forms for consideration by the Patent and Trademark Office in the above-entitled application and to be made of record therein. Copies of Reference Nos. 82-110 are enclosed.

In addition, this Information Disclosure Statement is being submitted pursuant to 37 C.F.R. §1.97(b) in that Applicants believe that it is being filed prior to the mailing date

---

**CERTIFICATE OF MAILING**

I hereby certify that, on the date shown below, this correspondence is being

- ☒ deposited with the United States Postal Service in an envelope addressed to Mail Stop: PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

**MAILING**

- ☐ 37 C.F.R. §1.8  
as first class mail.

- ☒ 37 C.F.R. §1.10  
as "Express Mail Post Office to Addressee"  
EXPRESS MAIL NO. EV 535075158 US

**FACSIMILE TRANSMISSION**

- ☐ transmitted by facsimile to the Patent and Trademark Office.

M. Sue Clements  
Name of Depositor

*M. Sue Clements*  
Signature

2/28/06  
Date

**PATENT**

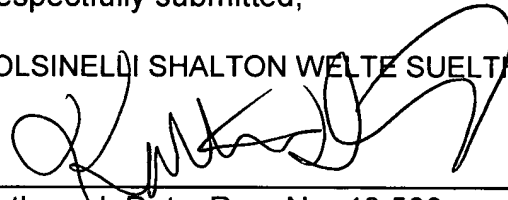
Atty Docket No. 102364

Express Mail Label No. EV 535075158 US

of the first Office action on the merits. Accordingly, neither a statement nor fee under 37 C.F.R. §1.97(c) or (d) is required. However, if an Office action was issued prior to the date of mailing of this Information Disclosure Statement, the Commissioner is hereby authorized to charge any required fees regarding this Information Disclosure Statement to Deposit Account 50-1662.

Respectfully submitted,

POLSINELLI SHALTON WELTE SUELTHAUS PC



Date: February 28, 2006

---

Kathryn J. Doty, Reg. No. 40,593  
100 South Fourth Street, Suite 1100  
St. Louis, Missouri 63102  
Tel: (314) 552-6850  
Fax: (314) 231-1776  
Attorney for Applicants

Under the Paper Work Reduction Act of 1995, no person are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	10/539,107
				Filing Date	June 15, 2005
				First Named Inventor	Tomasz Heyduk et al.
				Art Unit	1645
				Examiner Name	To be assigned
Sheet	1	of	4	Attorney Docket Number	102364

U.S. PATENT DOCUMENTS					
Examiner Initials*	Cite No. <sup>1</sup>	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appeal
		Number-Kind Code <sup>2</sup> (if known)			
	1	US 5,270,163	12-14-1993	Gold et al.	
	2	US 5,475,096	12-12-1995	Gold et al.	
	3	US 5,476,766	12-19-1995	Gold et al.	
	4	US 5,543,293	08-06-1996	Gold et al.	
	5	US 5,567,588	10-22-1996	Gold et al.	
	6	US 5,582,981	12-10-1996	Toole et al.	
	7	US 5,637,459	06-10-1997	Burke et al.	
	8	US 5,641,629	06-24-1997	Pitner et al.	
	9	US 5,650,275	07-22-1997	Pitner et al.	
	10	US 5,660,985	08-26-1997	Pieken et al.	
	11	US 5,670,637	09-23-1997	Gold et al.	
	12	US 5,683,867	11-04-1997	Biesecker et al.	
	13	US 5,688,935	11-18-1997	Stephens et al.	
	14	US 5,696,249	12-09-1997	Gold et al.	
	15	US 5,705,337	01-06-1998	Gold et al.	
	16	US 5,712,375	01-27-1998	Jensen et al.	
	17	US 5,723,289	03-03-1998	Eaton et al.	
	18	US 5,723,592	03-03-1998	Eaton et al.	
	19	US 5,750,342	05-12-1998	Stephens et al.	
	20	US 5,756,291	05-26-1998	Griffin et al.	
	21	US 5,763,566	06-09-1998	Jensen et al.	
	22	US 5,763,595	06-09-1998	Gold et al.	
	23	US 5,773,598	06-30-1998	Burke et al.	
	24	US 5,789,157	08-04-1998	Jensen et al.	
	25	US 5,789,160	08-04-1998	Eaton et al.	
	26	US 5,817,785	10-06-1998	Gold et al.	
	27	US 5,840,867	11-24-1998	Toole et al.	
	28	US 5,843,653	12-01-1998	Gold et al.	
	29	US 5,853,984	12-29-1998	Davis et al.	
	30	US 5,858,660	01-12-1999	Eaton et al.	
	31	US 5,861,254	01-19-1999	Schneider et al.	
	32	US 5,864,026	01-26-1999	Jensen et al.	
	33	US 5,874,218	02-23-1999	Drolet et al.	
	34	US 5,958,691	09-28-1999	Pieken et al.	
	35	US 5,962,219	10-05-1999	Gold et al.	
	36	US 5,989,823	11-23-1999	Jayasena et al.	
	37	US 5,998,142	12-07-1999	Gold et al.	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and no considered. Include copy of this form with next communication to applicant. <sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>See Kinds Codes of USPTO Patent Documents at [www.uspto.gov](http://www.uspto.gov) or MPEP 901.04. <sup>3</sup>Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). <sup>4</sup>For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. <sup>5</sup>Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. <sup>6</sup>Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. patent and Trademark Office, PO Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paper Work Reduction Act of 1995, no person are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	10/539,107
				Filing Date	June 15, 2005
				First Named Inventor	Tomasz Heyduk et al.
				Art Unit	1645
				Examiner Name	To be assigned
Sheet	2	of	4	Attorney Docket Number	102364

	38	US 6,001,570	12-14-1999	Grossman	
	39	US 6,001,577	12-14-1999	Gold et al.	
	40	US 6,011,020	01-04-2000	Gold et al.	
	41	US 6,013,443	01-11-2000	Heilig et al.	
	42	US 6,030,776	02-29-2000	Eaton et al.	
	43	US 6,048,698	04-11-2000	Eaton et al.	
	44	US 6,083,696	07-04-2000	Biesecker et al.	
	45	US 6,110,900	08-29-2000	Gold et al.	
	46	US 6,114,120	09-05-2000	Jensen et al.	
	47	US 6,127,119	10-03-2000	Stephens et al.	
	48	US 6,147,204	11-14-2000	Gold et al.	
	49	US 6,177,555 B1	01-23-2001	Jayasena et al.	
	50	US 6,207,388 B1	03-27-2001	Grossman	
	51	US 6,225,058 B1	05-01-2001	Munishkin et al.	
	52	US 6,261,774 B1	07-17-2001	Pagratis et al.	
	53	US 6,261,783 B1	07-17-2001	Jayasena et al.	
	54	US 6,291,184 B1	09-18-2001	Gold et al.	
	55	US 6,300,074 B1	10-09-2001	Gold et al.	
	56	US 6,329,145 B1	12-11-2001	Janjic et al.	
	57	US 6,331,398 B1	12-18-2001	Gold et al.	
	58	US 6,344,318 B1	02-05-2002	Gold et al.	
	59	US 6,376,190 B1	04-23-2002	Gold et al.	
	60	US 6,399,302 B1	06-04-2002	Lannigan et al.	
	61	US 6,423,493 B1	07-23-2002	Gorenstein et al.	
	62	US 6,465,188 B1	10-15-2002	Gold et al.	
	63	US 6,506,887 B1	01-14-2003	Smith et al.	
	64	US 6,544,746 B2	04-08-2003	Heyduk	
	65	US 6,613,526 B2	09-02-2003	Heilig et al.	
	66	US 6,680,377 B1	01-20-2004	Stanton et al.	
	67	US 6,716,583 B2	04-06-2004	Gold et al.	
	68	US 6,730,482 B2	05-04-2004	Gold et al.	
	69	US 6,916,613 B2	07-12-2005	Munishkin et al.	
	70	US 2002/0022224 A1	02-21-2002	Hornby et al.	
	71	US 2002/0037506 A1	03-28-2002	Lin et al.	
	72	US 2003/0087239 A1	05-08-2003	Stanton et al.	
	73	US 2003/0207271 A1	11-06-2003	Holwitt et al.	
	74	US 2003/0224435 A1	12-04-2003	Seiwert	
	75	US 2004/0053310 A1	03-18-2004	Shi et al.	
	76	US 2004/0058378 A1	03-25-2004	Kong et al.	
	77	US 2004/0067501 A1	04-08-2004	Kage	
	78	US 2004/0180360 A1	09-16-2004	Wilson et al.	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and no considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. patent and Trademark Office, PO Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paper Work Reduction Act of 1995, no person are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>		<b>Complete if Known</b>	
		Application Number	10/539,107
		Filing Date	June 15, 2005
		First Named Inventor	Tomasz Heyduk et al.
		Art Unit	1645
Examiner Name	To be assigned		
Sheet 3 of 4	Attorney Docket Number	102364	

79	US 2004/0219523 A1	11-04-2004	Stanton et al.	
80	US 2005/0069910 A1	03-31-2005	Turner et al.	
81	US 2005/0106594 A1	05-19-2005	Ellington et al.	

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Cite No. <sup>1</sup>	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, columns, lines, Where Relevant Passages Or Relevant Figures Appear	T <sup>6</sup>
		Country Code <sup>2</sup> -Number <sup>3</sup> -Kind Code <sup>4</sup> (if known)				
	82	WO 03/064657 A1	08-07-2003	Saint Louis University		
	83	WO 03/078449 A2	09-25-2003	Saint Louis University		

Examiner Signature		Date Considered	
--------------------	--	-----------------	--

NON-PATENT LITERATURE ARTICLES			
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the authority (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	84	BOCK, L.C., et al., "Selection of single-stranded DNA molecules that bind and inhibit human thrombin", <i>Nature</i> (1992) pp. 564-6, Vol. 355.	
	85	BURGSTALLER, P., et al., "Synthetic Ribozymes and the First Deoxyribozyme", <i>Angew. Chem. Int. Ed. Engl.</i> (1995) pp. 1189-92, Vol. 34, No. 11.	
	86	ELLINGTON, A.D., et al., "In vitro selection of RNA molecules that bind specific ligands", <i>Nat.</i> (1990) pp. 818-22, Vol. 346.	
	87	FAMULOK, M., et al., "In Vitro Selection of Specific Ligand-binding Nucleic Acids", <i>Angew. Chem. Int. Ed. Engl.</i> (1992) pp. 979-88, Vol. 31.	
	88	FANG, et al., "Synthetic DNA Aptamers to Detect Protein Molecular Variants in a High-Throughput Fluorescence Quenching Assay", <i>ChemBioChem.</i> (2003) pp. 829-34, Vol. 4.	
	89	GOLD, L., et al., "Diversity of Oligonucleotide Functions", <i>Ann. Rev. Biochem.</i> (1995) pp. 763-97, Vol. 64.	
	90	HAMAGUCHI, et al., "Aptamer Beacons for the Direct Detection of Proteins", <i>Analy. Biochem.</i> (2001) pp. 126-31, Vol. 294.	
	91	HEYDUK, E., et al., "Thiol-reactive, Luminescent Europium Chelates: Luminescence Probes for Resonance Energy Transfer Distance Measurements in Biomolecules", <i>Anal. Biochem.</i> (1997) pp. 216-27, Vol. 248.	
	92	HEYDUK, E., et al., "Conformational Changes of DNA Induced by Binding of <i>Chironomus</i> High Mobility Group Protein 1a (cHMG1a)", <i>J. Biol. Chem.</i> (1997) pp. 19763-70, Vol. 272, No. 32.	
	93	HEYDUK, E., et al., "Homogeneous Fluorescence Assay for Cyclic AMP", <i>Comb. Chem. and High Throughput Screen.</i> (2003) pp. 347-54, Vol. 6.	
	94	HEYDUK, T., et al., "Luminescence Energy Transfer with Lanthanide Chelates: Interpretation of Sensitized Acceptor Decay Amplitudes", <i>Analy Biochem</i> (2001) pp. 60-7, Vol. 289, No. 1.	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and no considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. patent and Trademark Office, PO Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Under the Paper Work Reduction Act of 1995, no person are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449/PTO  <b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b> <i>(Use as many sheets as necessary)</i>				<b>Complete if Known</b>	
				Application Number	10/539,107
				Filing Date	June 15, 2005
				First Named Inventor	Tomasz Heyduk et al.
				Art Unit	1645
Examiner Name	To be assigned				
Sheet	4	of	4	Attorney Docket Number	102364

95	HEYDUK, T., et al., "Molecular beacons for detecting DNA binding proteins", <i>Nat. Biotech.</i> (2002) pp. 171-6, Vol. 20.	
96	HEYDUK, E., et al., "Molecular beacons for detecting DNA binding proteins: mechanism of action", <i>Analyt. Biochem.</i> (2003) pp. 1-10, Vol. 316.	
97	JAYASENA, S.D., "Aptamers: An Emerging Class of Molecules That Rival Antibodies in Diagnostics", <i>Clin. J. Chem.</i> (1999) pp. 1628-50, Vol. 45, No. 9.	
98	KLUG, S., et al., "All you wanted to know about SELEX (but were afraid to ask...)", <i>Mol. Biol. Rep</i> (1994) pp. 97-107, Vol. 20.	
99	KNOLL, E., et al., "Unimolecular Beacons for the Detection of DNA-Binding Proteins", <i>Anal. Chem.</i> (2004) pp. 1156-64, Vol. 76, No. 4.	
100	LI, J.J., et al., "Molecular Aptamer Beacons for Real-Time Protein Recognition", <i>Biochem. and Biophys. Res. Commun.</i> (2002) pp. 31-40, Vol. 292, No. 1.	
101	MATHIS, G., "Probing Molecular Interactions with Homogeneous Techniques Based on Rare Earth Cryptrates and Fluorescence Energy Transfer", <i>Clinic. Chem.</i> (1995) pp. 1391-7, Vol. 41, No. 9.	
102	MATLOCK, D.L., et al., "Sequence Determinants for the Recognition of the Fork Junction DNA Containing the -10 Region of Promoter DNA by <i>E. coli</i> RNA Polymerase", <i>Biochem.</i> (2000) pp. 12274-83, Vol. 39, No. 40.	
103	MILLS, J.B., et al., "Flexibility of Single-Stranded DNA: Use of Gapped Duplex Helices to Determine the Persistence Lengths of Poly(dT) and Poly(dA)", <i>J. Mol. Biol.</i> (1999) pp. 245-57, Vol. 285.	
104	SELVIN, P.R., et al., "Luminescence Resonance Energy Transfer", <i>J. Am. Chem. Soc.</i> (1994) pp. 6029-30, Vol. 116.	
105	SELVIN, P.R., et al., "Luminescence energy transfer using a terbium chelate: Improvements on fluorescence energy transfer", <i>Proc. Natl. Acad. Sci USA</i> (1994) pp. 10024-8, Vol. 91.	
106	TASSET, D.M., et al., "Oligonucleotide Inhibitors of Human Thrombin that Bind Distinct Epitopes", <i>J. Mol. Biol.</i> (1997) pp. 688-98, Vol. 272.	
107	TUREK, C., et al., "Systematic Evolution of Ligands by Exponential Enrichment: RNA Ligands to Bacteriophage T4 DNA Polymerase", <i>Sci</i> (1990) pp. 505-10, Vol. 249, No. 4968.	
108	WILSON, D.S., et al., "In Vitro Selection of Functional Nucleic Acids", <i>Ann. Rev. Biochem.</i> (1999) pp. 611-47, Vol. 68.	
109	XU, W., et al., "Anti-peptide aptamers recognize amino acid sequence and bind a protein epitope", <i>Proc. Natl. Acad. Sci. USA</i> (1996) pp. 7475-80, Vol. 93.	
110	YAMAMOTO, R., et al., "Molecular beacon aptamer fluoresces in the presence of Tat protein of HIV-1", <i>Genes Cells</i> (2000) pp. 389-96, Vol. 5.	

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and no considered. Include copy of this form with next communication to applicant.

<sup>1</sup>Applicant's unique citation designation number (optional). <sup>2</sup>Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 USC 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. patent and Trademark Office, PO Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

<b>CERTIFICATE OF MAILING BY "EXPRESS MAIL" (37 CFR 1.10)</b>			<b>Matter No.</b>	
Applicant(s): Tomasz Heyduk et al.			<b>102364</b>	
<b>Serial No.</b>	<b>Filing Date or 371 Date</b>	<b>Examiner</b>	<b>Group Art Unit</b>	<b>Confirmation No.</b>
10/539,107	June 15, 2005	TBA	1645	2295

**Invention: BIOSENSORS FOR DETECTING MACROMOLECULES AND OTHER ANALYTES**

I hereby certify that: an Information Disclosure Statement Letter to the U.S. Patent and Trademark Office (2 pages); Forms PTO/SB/08A and B Information Disclosure Statement by Applicant (4 pages); 1 Copy of Reference Nos. 82-110; Certificate of Mailing by Express Mail (1 page); authorization to charge any fees which may be required or credit any overpayments to Deposit Account No. 50-1662; and a stamped, pre-addressed postcard are being mailed by U.S. Postal Service Express Mail to Addressee: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 28th day of February, 2006.

**M. Sue Clements**

(Typed or Printed Name of Person Mailing Correspondence)

*M. Sue Clements*

(Signature of Person Mailing Correspondence)

**EV 535075158 US**

("Express Mail" Mailing Label Number)